We claim:

1. A process for preparing catalyst systems of the Ziegler-Natta type, which comprises the following steps:

A) bringing an inorganic metal oxide into contact with a tetravalent titanium compound and

B) bringing the intermediate obtained from step A) into contact with a magnesium compound $MgR^1_nX^1_{2-n}$, where X^1 are each, independently of one another, fluorine, chlorine, bromine, iodine, hydrogen, NR^X_2, OR^X, SR^X, SO_3R^X or $OC(O)R^X$, and R^1 and R^X are each, independently of one another, a linear, branched or cyclic C_1-C_{20}-alkyl, a C_2-C_{10}-alkenyl, an alkylaryl having 1-10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or a C_6-C_{18}-aryl and n is 1 or 2,

C) bringing the intermediate obtained from step B) into contact with a halogenating reagent of the formula R^Y_s-E-Y_{4-s}, where R^Y are each, independently of one another, hydrogen, a linear, branched or cyclic C_1-C_{20}-alkyl, a C_2-C_{10}-alkenyl, an alkylaryl having 1-10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or a C_6-C_{18}-aryl, E is carbon or silicon, Y is fluorine, chlorine, bromine or iodine and s is 0, 1, 2 or 3 when E is carbon and s is 1, 2 or 3 when E is silicon.

2. A process for preparing catalyst systems as claimed in claim 1, wherein a magnesium compound MgR^1_2 is used in step B).

3. A process for preparing catalyst systems as claimed in claim 1 or 2, wherein the halogenating reagent used in step C) is chloroform.

4. A process for preparing catalyst systems as claimed in any of claims 1 to 3, wherein the inorganic metal oxide used in step A) is a silica gel.

5. A process for preparing catalyst systems as claimed in any of claims 1 to 4, wherein the tetravalent titanium compound used in step A) is titanium tetrachloride.

6. A process for preparing catalyst systems as claimed in any of claims 1 to 5, which comprises the following steps:

A) bringing an inorganic metal oxide into contact with a tetravalent titanium compound and

B) bringing the intermediate obtained from step A) into contact with a magnesium compound $MgR^1_nX^1_{2-n}$, where X^1 are each, independently of one another, fluorine, chlorine, bromine, iodine, hydrogen, NR^X_2, OR^X, SR^X, SO_3R^X or $OC(O)R^X$, and R^1 and R^X are each, independently of one another, a linear, branched or cyclic C_1-C_{20}-alkyl, a C_2-C_{10}-alkenyl, an alkylaryl having 1-10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or a C_6-C_{18}-aryl and n is 1 or 2,

C) bringing the intermediate obtained from step B) into contact with a halogenating reagent of the formula R^Y_s-E-Y_{4-s}, where R^Y are each, independently of one another, hydrogen, a linear, branched or cyclic C_1-C_{20}-alkyl, a C_2-C_{10}-alkenyl, an alkylaryl having 1-10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or a C_6-C_{18}-aryl, E is carbon or silicon, Y is fluorine, chlorine, bromine or iodine and s is 0, 1, 2 or 3 when E is carbon and s is 1, 2 or 3 when E is silicon, and

D) optionally bringing the intermediate obtained from step C) into contact with a donor compound.

7. A process for preparing catalyst systems as claimed in claim 6, wherein the donor compound used in step D) contains at least one nitrogen atom.

8. A catalyst system of the Ziegler-Natta type which can be prepared by a process as claimed in any of claims 1 to 7.

9. A prepolymerized catalyst system comprising a catalyst system as claimed in claim 7 and linear C_2-C_{10}-1-alkenes polymerized onto it in a mass ratio of from 1:0.1 to 1:200.

10. A process for the polymerization or copolymerization of olefins at from 20 to 150°C and pressures of from 1 to 100 bar in the presence of at least one catalyst system as claimed in claim 8 or 9 and, if appropriate, an aluminum compound as cocatalyst.

11. A process for the polymerization or copolymerization of olefins as claimed in claim 10, wherein a trialkylaluminum compound whose alkyl groups each have from 1 to 15 carbon atoms is used as aluminum compound.

12. A process for the polymerization or copolymerization of olefins as claimed in claim 10 or 11, wherein ethylene or a mixture of ethylene and C_3-C_8-α-monoolefins is (co)polymerized.

13. The use of a catalyst system as claimed in claim 8 or 9 for the polymerization or copolymerization of olefins.